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REPORT

—OF—

E. W. HUMPHREYS AND G. W. DELAWDER,

—THE—

Commissioners of Fisheries,

—OF—

MARYLAND;

JANUARY, 1886.



ANNAPOLIS:

GEORGE T. MELVIN, State Printer.

1886.

REPORT.

To his Excellency

Governor Henry Lloyd :

We beg leave to submit herewith our Report, as State Commissioners of Fisheries, for the year ending December 31st, 1885 :

The very marked success of the operations of the Fish Commission in previous years has taught us to pursue, as our main purpose, the same policy of propagating the four principal kinds of spring fishes, viz: The shad, rock, perch and herring. We have also given the German carp our usual great care, and the brook trout, salmon trout and white fish have had a large share of our attention.

The results of the work for the year are greater than formerly on account of the advantages of the great recent progress in the science of pisciculture. Experience has given our force of employees greater efficiency, and recently improved hatching apparatus has enabled us to simplify, concentrate and greatly increase our operations. Up to the beginning of last year we had only one hatching house—that at Druid Hill Park, Baltimore. We have now three additional ones, each equipped with the finest hatching system in use, located as follows

Choptank hatchery, on Tuckahoe creek, near Cowards point, in Caroline county, about four miles from Hillsborough ; Nanticoke hatchery, at Twiford's Mills, about one mile from Sharptown, and a-half mile from the Nanticoke river. The Wicomico hatchery is at Salisbury, headwaters of the Wicomico river

The Choptank station is intended to supply the waters of the upper eastern shore with shad and perch. In this house there is a set of McDonald automatic hatching jars, having place upon a table 3x12 feet in dimensions. The jars are supplied with water by pipes leading from an elevated tank, the water being pumped

into this by a six inch Rider Hot Air Engine, with a guaranteed capacity of 1,200 gallons per hour. The water is pumped directly from the creek and is returned thereto through vent pipes from the hatching table. The building is substantially constructed of wood, and stands on piles over the edge of the creek. Owing to delays in receiving the material for this building, also the engine, this hatchery was not completed until about the close of the season, which was unusually early, and no eggs were hatched in it, although everything was completed and put in perfect working order. The work at this point was consequently done by the old system, which has been described in reports of the Commission heretofore. Mr. J. Harman Hines is the superintendent of the work at this station, with a force of three subordinates.

The Nanticoke hatchery is intended to supply the Nanticoke river and the waters of Dorchester county with shad, rock, perch and herring. This house was completed in due time and is supplied with the McDonald jars. The water is obtained through pipes from the dam of the mills, just below which the house stands, the water having a fall of four or five feet. This hatchery may be described as generally identical with that at Coward's Point, except as to the water supply. The location of this station was selected as being at a central point of the fresh water fisheries of the Nanticoke river. Between Vienna and Seaford (Del.), and the mouth of the "north-west prong" of the Nanticoke and Federalsburg there are extensive fisheries. Hauling and floating seines and pound nets are principally used. Heretofore these waters have not been made use of in our work for obvious reasons. Having made a survey of them, however, in 1884, we were persuaded that they might be made available by placing a hatchery at Sharptown and running a steam launch between the three points—Seaford, Vienna and Federalsburg, a distance all around of about forty miles—to collect spawn and convey it to the hatchery, and in turn to transport the fry, after having been hatched, to various points within these limits for planting. These plans have been executed and the tabulated report on page — of the operations at this station will show that in it we have been reasonably successful, considering that this is the first work done under this new system. Capt. Jas. C. D. Adams is superintendent of this work, with a force of five subordinates.

The Wicomico hatchery is intended to supply the waters of the lower Eastern Shore with shad, perch and herring. It is supplied with water from the dam of the Locust Grove Flour Mills. The house is constructed upon the foundation of a large saw-mill—now out of use as a mill, but occupied as a warehouse. The same system of jars is employed here as at the other stations. The eggs for this hatchery are gathered about Shad Point and the Upper Ferry, and intermediate points along the Wicomico river. Thos Hughlett, Jr., is superintendent of this station, and we have here a force of five subordinates. At this station our white-fish eggs also were hatched, the fry having been distributed generally to all the rivers of the Eastern Shore. The planting of white-fish in Maryland waters is experimental. This fish belongs naturally to the great lakes, but it is reasonable to suppose that it may be colonized and acclimated. The expense being small, as the eggs are supplied by the U. S. Fish Commission, we consider it an experiment worth trying. We are supported in this view by the opinion of the eminent United States Commissioner. This is one of the finest of our North American fishes, and the advantages to be obtained by its successful introduction into our waters will be invaluable.

We were very fortunate in the selection of the sites for this and the Nanticoke stations, as we secured at both of them a natural and inexhaustible supply of pure, clear water, whereas at the Choptank hatchery we were forced to the use of an artificial supply, which is very much more expensive, and the water from the creek is more or less muddy.

At all these stations we use trays for the transportation of shad eggs from the fishing shores, where they are impregnated, to the hatcheries. The trays consist of a coarse wire screen, fourteen to sixteen inches square for the bottom, attached to frames made of wooden pieces one inch square and fastened at the corners; over these are placed pieces of cheese cloth a little larger than the trays, upon which the fertilized eggs are spread two or three layers deep; a number of these trays being filled as described and stacked one upon another, and strapped together, makes a package convenient to handle in transit by almost any means of conveyance, and affords a sure protection for the eggs. We have carried shad eggs in this manner, one hundred and thirty-two miles by railroad without injury, the same being afterwards hatched with the same results as of those which had not been moved.

Although our work has greatly increased, and will, we have cause to believe, continue to increase yearly, yet we will not be satisfied that we have accomplished the full measure of success which we hope for, until we have done many times better than heretofore in regard to numbers hatched, particularly of shad and rock. We believe we can, with advantage, seek shad and rock spawn outside the limits of our own State and transport the same hither to our hatcheries by means of the trays above described. We made an effort last summer to inspect suitable waters, particularly Albemarle sound and tributary streams, ex-Commissioner S. G. Worth, of North Carolina, gave us the assurance of his cheerful co-operation, and being familiar, by experience, with the fisheries of the above named waters, kindly offered to point out to us the fresh water shad fisheries at the most convenient points, and give any other information upon the subject, and such advice as from his experience he should consider necessary, whenever we should find it convenient to visit such points. But having applied to your Excellency for the use of one of the steamers of the State Oyster Navy, for the necessary cruise, we were sorry to learn that the Governor has no authority to order the boats beyond the borders of the State. Your Excellency, it is proper for us to say, expressed his regrets and assured us that he would have been glad to extend to us such assistance had he felt justified by the law in so doing; we were therefore obliged to abandon our purpose for the present, but we shall hope for better fortune in the future.

It is with no small degree of pride and satisfaction that we call your attention to our increased and improved work, as shown by our tables, and the certain evidences of good results. It is not self praise which prompts this expression, but rather our admiration of, and complete faith in, the science of fish culture, and especially artificial propagation and planting. The work of your commission has long since ceased to be experimental, but it has become practical and fully operative, and it is without doubt a *necessity*. Without it, in less than five years, it is the belief of observing people, and those who are well informed as to the subject, our shad, the finest and most valued of our native fishes, would become unknown in our fresh waters. The enormous and almost incredible number of persons who now engage in fishing in spring, the improved methods of catching, consisting of every conceivable device, the

unscrupulous manner of using these means, and the want of adequate protective laws, would, in the absence of artificial propagation, tend to the total destruction, within a few years, of all our most desirable kinds of fish. In the Wicomico river alone, at least 200 floating shad and herring seines (and some estimate the number to be 250,) are operated within the space of 17 miles, or between Shad point and White Haven. And if we allow the average catch of each net of two shad per day for 60 days, the total catch of the "floaters" within that area is 18,000 shad each season. This is said by some fishermen to be a ridiculously small estimate. Besides the floating seines, there are within the above named section of the Wicomico, five hauling seines, the average catch of which, we will say is ten shad each per day for 60 days, the total being 3,000. Besides the floating and hauling seines, there are in the section named numerous weirs and stake-seines, the number of which and the catch by them it would be difficult to estimate. Lower down this river, towards its mouth, there are 15 or 20 pound and fyke-nets, with an average catch of at least 20 each per day for 60 days, a total of *twenty-four thousand*. In addition to the "pounds" and "fykes," there are at least treble this number of stake-seines, and the average catch of them may be safely estimated to be five shad per day for each, making a total of *thirteen thousand five hundred*. We do not here take into account the numerous weirs and small nets in the various parts—bays, creeks, &c.—of the lower Wicomico, as the number of them and their catch cannot now be correctly computed.

The method of setting the fykes and pounds is across the current. The pound (or trap) is placed at the edge of the channel, and from it is stretched a hedging of net reaching to shore. The meshes of these nets are very small, allowing nothing but minnows to pass. In them are caught immense quantities of small fish, which are entirely unmarketable. The fish when taken out of these nets are dumped into boats and carried some distance often, to a landing where they are overhauled and assorted, the time consumed in the process being almost always sufficiently long to destroy the small or "refuse" fish. These are sometimes thrown overboard, but far more often fed to hogs or thrown out for manure upon the land.

Reviewing the above estimates we obtain a grand total of *sixty thousand three hundred shad*. We have

taken into this account only one species of our native native fishes—the shad—it being the most important, and we have done so for illustration of the enormous number of fish taken annually from one river only, and that one of the smallest in the State.

We have not at our disposal the means wherewith to gather accurate statistics as to the actual number of men, seines or traps, boats, &c., which are employed in fishing throughout the State, and consequently can only imperfectly approximate, and probably far underestimate, the extent of our fisheries. We hope, however, that your Commission may be supplied with the necessary means to enable it, in its next report, to present detailed statistics.

The catch of the other principal spring fishes, the rock, perch and herring, is somewhat less during the spring season, than that of the shad. The first two named, however, are taken the whole year through, and consequently in the aggregate the catch is much larger. It is, to say the least, as large, comparing the extent of the Wicomico, with that of the larger rivers, the Nanticoke, Choptank, Chester, Susquehanna, and nearly twenty others, some larger, some smaller, we conclude that the total catch of the rivers throughout the whole State, is at the very least, fifty times greater than that of the Wicomico, which we have given somewhat in detail. The number of shad taken in this river being *sixty thousand three hundred*, the value of the same at *twenty-five cents* each, is over fifteen thousand dollars; adding to this our estimate of the other fish usually taken, we double this amount, and multiplying this by fifty, we have the grand product of *over a million and a half dollars yearly*. Few of us realize the importance of our fishery interest, these estimates are for the rivers alone, as we have not spoken of the bay.

But it is even outside the rivers and into the bay that we must go, if we would thoroughly remedy the existing evils. We have asserted that the artificial propagation, especially of our spring fishes, the shad, rock, perch and herring, is a necessity. To further substantiate this, we beg to remind you that there are, according to official estimates of Col. Marshall McDonald, of the United States Fish Commission, the enormous number of one thousand pound-nets fringe the shores of the Chesapeake Bay below the Potomac river. These are placed, and set as herein previously described, along the shoals, the natural feeding grounds of the shad, upon

which the fish travel in their migrations towards the fresh waters of the rivers. They have to "run a muck," through all the traps in their journey to the spawning places at the headwaters of the tributary streams, to reach which is their sole object in leaving the sea. It is a great wonder that any of them ever reach fresh water, but they do, however, and in considerable numbers, as we have shown. But comparatively few escape the traps here awaiting them and deposit their eggs spontaneously and naturally; very many are caught before spawning or at just about the spawning period, and very few after having spawned. It is under these conditions that the employees of the Commission seek out among the fishermen, such fish as about to deposit their eggs when caught, and from such fish collect the spawn and impregnate, and otherwise prepare it for artificial hatching. The men are ordered to secure every "ripe" fish possible, we cannot, of course, with the means at our disposal obtain all ripe fish, and it would be inexpedient to do so in isolated localities, even if our resources were unlimited. But the number of them which we do secure are *saved* from absolute destruction because the offspring, after the eggs are hatched, are returned to the water to become in due time adult fish. Without such treatment who can doubt that every species of our anadromous fishes would, in a few years, entirely disappear.

This is one grand remedy for the evil of the general and indiscriminate use of the various fish-traps, the chief of which are the pound or fyke. But it is doubtful that this can hold out so many years against such powerful odds. The number of these nets are increasing year after year, and the supply of fish is only slightly improving. Our fish protective laws are deplorably inadequate, and the meagre attention given to our fishery interests by the law makers in this age of progress is not easy to understand. Our fisheries need regulating, and we hope and believe that the suggestions which we will venture to make in this report will be favorably considered. Among many other things, steamboats, particularly side-wheelers, which now ply upon every river, play an important part in the destruction of our fish, by washing the bottom and banks of the rivers, especially in the narrow parts, near the sources in fresh water, to which the fish invariably go for spawning. As the eggs are deposited, some (as the shad and rock) on the clean, sandy bottom, and others (as the perch and

herring) on grasses and other growths, twigs, &c., it is easily seen how destructive the swells and eddies from the track of a passing steamer must be to these eggs, covering them up and burying them, or else washing them up high and dry upon the shore, there to remain and be lost. Hauling seines are also sources of destruction to fish eggs along the shores and upon the bars and shoals upon which the seines are operated. But the fishing of these cannot be forbidden. It can only be restricted. Another great source of destruction is found in some species of our fishes which feed upon the spawn of its own and all other kinds. It is generally known that they prefer this to any other food, as they always feed most ravenously upon it. The eggs taken and hatched are subject to no accidents. The young fish are too small and too widely separated when planted to afford an opportunity for a good mouthful for even a minnow, while the spawn, as in the process of spontaneous hatching, lies unprotected when deposited in larger or smaller masses, a tempting feast for such piscatorial poachers as happen to pass that way, and to be had simply for the opening of the mouth and swallowing.

We speak of only a few causes of the depletion of our waters, but we believe we have mentioned the principal ones. We believe that artificial propagation and planting constitute the great remedy for these evils, but we believe just as strongly that these means should be supplemented by others, and in reference to this matter we beg to recommend certain measures which we are convinced will, if adopted, prove of great advantage.

We would advise the establishing of a closed season of two days in each week from Saturday morning 6 o'clock, to Monday morning 6 o'clock, during the months of April and May in which all net fishing should be prohibited. By this means the fish would be allowed to proceed undisturbed to their natural spawning places. The advantages of this are easily seen, and we think the great importance of the matter cannot be too strongly urged. For the Susquehanna and Nanticoke rivers and the Chesapeake bay co-operative legislation will be required, as each of these extend beyond our borders. For the Nanticoke, the necessary Act was passed by the Legislature of Delaware at its last session. We would further recommend the regulation of the size of meshes in nets, and other traps used in fishing, the meshes to be in no case smaller than one and

a quarter inches square, or two and a half inches extended. We would endeavor to prohibit the catching, or having in possession of any fish, except the sun-fish or the smelt, of less than six or seven inches in length. However, we think that in case fish of such size are accidentally caught, the offender should be exonerated by returning the same to the water without further injury.

Whilst we suggest what we believe to be necessary legislation for the protection of fish in the waters above referred to, we earnestly recommend and urge, that some more effective means be adopted for the protection of fish in the upper Potomac. The great difficulty we have met with in this locality lies in the fact that citizens of West Virginia place innumerable fish-pots and other traps in the Potomac, which are near to and easily reached from the West Virginia shore, and by such means and devices destroy the fish. It is impossible to prevent this system of wholesale slaughter without having some person or persons on the ground clothed with authority to make arrests and bring such offenders to punishment. We therefore suggest that a law be passed making such acts criminal, and the offenders liable to indictment by a grand jury. We also recommend the passage of an Act empowering the Fish Commissioners to appoint for this locality a Fish Warden or Wardens, whose duty it shall be to destroy all fish-pots and other devices placed in said river for the purpose of catching or taking fish. Such wardens to be employed during the months of October and November, inasmuch as during that period whilst the waters are swollen from the fall rains, the fish suffer most from the causes referred to. And that such wardens be clothed with authority to arrest anybody violating such Act, or Acts, of Assembly. We believe that by such a system as this, or one similar, the fish slaughter-houses, otherwise known as fish-pots, would be annihilated in a short time. We think any law passed upon this subject, therefore, should give the commissioners a discretion as to the time of employment of such wardens, so that their services could be readily dispensed when in the judgment of the Commissioners they were no longer necessary.

In addition to the propagation and cultivation of the species above referred to, we are meeting with decided success with the German carp, land locked salmon, rainbow trout and brook trout. These last named seem espec-

ially to meet the wants of the people of Western Maryland. The mountain streams of fresh water are especially suitable for the trout and land locked salmon, and when thoroughly stocked with these varieties will furnish sport for all the citizens of the State; whilst the carp is a food fish in every sense of the term and can be cultivated by every farmer on his own premises just as easily as he raises his pigs in the sty. It has been a matter of astonishment to us to see how many of the people are making carp ponds and with what eagerness they seek for this fish. We are experimenting with half a million of white fish, which are now being hatched at Druid Hill Park. It is hoped we shall be able to mature these in all mill-ponds and large pools of water in the fresh water counties of the State.

We now desire to call attention to what we consider a great evil, viz: The fact that in any of the markets of the State where fish are sold, dealers offer, and in fact sell, white and yellow perch four or five inches in length, and rock but little longer. This ought to be prohibited by law, for it does seem to us a shame that a rock fish which will grow to a hundred pounds should be wilfully destroyed when weighing a few ounces. It is nonsense to talk about the scarcity of fish whilst men are not only allowed to take these small fish, but are permitted to sell them in the public markets.

Whilst upon the subject of protecting fish, we beg to call attention to the fish ways heretofore provided for on the Potomac, three of which have been erected and put in place, and the materials for the fourth are all in readiness for completion as soon as the water recedes sufficiently for that purpose. This work was entrusted, by the Act of Assembly, to the Commissioners of the western shore, and as soon as the fourth way is put in place, a detailed report of the entire work will be made. We have thus briefly called attention to such matters as we deem necessary, and we will be glad to confer with your Excellency or Members of the General Assembly, and give such information as may be in our possession, and any assistance in our power in forwarding any legislation upon this subject.

Before closing this report, we desire to acknowledge the uniform kindness of your Excellency in co-operating with us in our work when occasion required, and also to ex-Governor McLane.

Our thanks are due the Baltimore and Ohio Company for yearly passes and for transportation of our fish,

cans, &c. We are all the more grateful for these favors because they were unsolicited, we have received similar favors from the Pennsylvania, and New York, Pennsylvania and Norfolk Railroads. To no official or individual, are we under more obligations than to Prof. Band of the United States Fish Commission from whom we have not only received many courtesies, but also substantial aid and assistance in our work, for all of which we desire to make our acknowledgments. We also acknowledge attentions received from Mr. S. G. North, ex-Commissioner of North Carolina, also to ex-Commissioner Hughlett of Maryland, and to Mr. Finford, for use of ground and water supply for Nanticoke hatchery.

All of which is respectfully submitted,

E. W. HUMPHREYS,

G. W. DELAWDER,

Commissioners.

Dec. 31st, 1885.

APPENDIX,

(REFERRED TO IN REPORT.)

**Showing in detail the Date of Fish Taken, Eggs
Fertilized, Fry Hatched, Where Deposited,
&c., at the different stations.**

INDEX

THE INDEX TO THE
PUBLISHED WORKS OF
JAMES H. CLARK
IS HERE
GIVEN IN THE
FORM OF A
LIST OF THE
PAGES ON WHICH
THE SUBJECTS
ARE TREATED.

DISTRIBUTION OF GERMAN CARP.

Hon. Wm. R. Getty, Garrett county.....	300
Henry Beckman, Garrett county.....	100
Joseph Dewitt, Garrett county.....	100
John Harned, Garrett county.....	100
Henry Weber, Garrett county.....	100
V. Kahl, Garrett county.....	100
Christian Slabaugh, Garrett county.....	100
Henry Reesche, Garrett county.....	100
Arthur Ashby, Garrett county.....	100
A. D. Mullinix, Howard county.....	100
B. S. Woolston, Baltimore county.....	100
Aaron Clary, Frederick county.....	100
H. F. Heath, Howard county.....	100
G. W. Clay, Frederick county.....	100
Geo. W. Seabold, Baltimore county.....	100
Isaac E. Meushaw, Harford county.....	100
John Stansbury, Carroll county.....	100
C. C. Wooden, Carroll county.....	100
F. M. Pierce, Baltimore county.....	100
John Heflebower, Washington county.....	100
Dr. Fish Elgen, Harford county.....	100
Joseph McCall, Baltimore county.....	100
Joseph McAvoy, Howard county.....	100
David Patterson, Baltimore county.....	100
Albert Gosnell, Baltimore county.....	100
Henry Christman, Carroll county.....	100
H. J. Jean, Baltimore county.....	100
H. F. Schoemborn, Baltimore county.....	100
W. Iglehart, Baltimore county.....	100
W. Marshall, Prince George's county.....	100
Adam Russon, Prince George's county.....	100
Wm. Matthews, Howard county.....	100
Dr. A. Riggs, Howard county.....	100
Gustavus Warfield, Howard county.....	100
Charles D. Warfield, Howard county.....	100
Walter Dorsey, Howard county.....	100
J. M. Delashmuth, Howard county.....	100
W. O. Robb, Howard county.....	100
Margaret Miller, Howard county.....	100
Palaski Dorsey, Howard county.....	100

DISTRIBUTION OF GERMAN CARP—Con.

David Feelmyer, Howard county.....	100
M. D. Gralan, Howard county.....	100
Julius Wask, Howard county.....	100
Henry Forsyth, Howard county.....	100
J. McGuire, Howard county.....	100
Washington Carr, Howard county.....	100
Prof. Manpin, Howard county.....	100
Thomas B. Owings, Howard county.....	100
J. R. Clark, Howard county.....	100
Charles Brisco, Howard county.....	100
B. S. Dixon, Howard county.....	100
F. Flourstadt	100
Wm. Lemory, Howard county.....	100
A. P. Gorman, Howard county.....	10
George O'Brian, Harford county.....	100
Dr. Frederick S. Lewis, Harford county.....	100
J. H. Stansbury, Carroll county.....	100
Wm. S. Weleer, Baltimore county.....	100
John C. Hagan, Frederick county.....	100
John Summers, Frederick county....	100
E. Goldsborough, Frederick county.....	100
Elias Grave, Frederick county.....	100
John L. Hargot, Frederick county.....	100
J. B. Hubble, Frederick county.....	100
Anthony Wickles, Frederick county.....	100
C. Holler, Frederick county.....	100
J. Wm. Baughman, Frederick county.....	500
W. J. Davis, Harford county.....	100
James Day, Harford county.....	100
Miss Hattie Reynolds, Baltimore county.....	100
Thomas J. Mullinix, Carroll county.....	100
U. O. Kolb, Frederick county.....	100
C. C. Rhodes, Baltimore county.....	100
Francis W. Gosnell, Baltimore county.....	100
Dennis Dutrow, Carroll County.....	100
F. M. Griffith, Montgomery county.....	100
B. Turner, Baltimore city.....	100
J. W. Robinette, Allegany county.....	100
Samuel Sonneborn, Allegany county.....	100
Robert Shriver, Allegany county.....	100
Albert G. Warfield, Howard county.....	100
Wm. R. Davis, Howard county.....	100
Octavo Devries, Carroll county.....	100
Potomac river.....	300
Youghhegheny river.....	200
Patapsco river, Carroll county.....	300
Patuxent river.....	300

DISTRIBUTION OF BROOK TROUT FROM DRUID HILL STATION,
1885.

Picket's Branch, Howard county.....	5,000
Hipsley branch, Howard county.....	3,000
Cabbin branch, Howard county.....	3,000
Morgan's run, Carroll county.....	3,000
In Baltimore county.....	10,000
In Harford county.....	25,000
In Castleman river, Garrett county.....	2,000
In Deep creek, Garrett county.....	10,000
In Patapsco river, Howard, Carroll and Baltimore counties.....	10,000 6,000
In Frederick county.....	5,000
Total	<hr/> 79,000

LAND-LOCKED SALMON.

Five thousand were hatched, and all of them
were placed in Deep creek, Garrett county.... 5,000

RAINBOW, OR CALIFORNIA TROUT.

Ten thousand were hatched and distributed in
the following rivers:

Patapsco river.....	3,000
Potomac river.....	4,000
Deep creek.....	3,000
Total.....	<hr/> 10,000

SHAD AT HAVRE-DE-GRACE STATION, 1885, APRIL AND MAY.

Number of fry hatched at this point was a fraction over
six millions, and distributed as follows:

In the Susquehanna river.....	4,000,000
In the Patapsco river.....	1,000,000
In the Patuxent river.....	1,000,000
Total.....	<hr/> 6,000,000

AT DRUID HILL PARK HATCHERY,

Eleven hundred thousand were hatched and dis-
tributed

In the Patapsco river.....	500,000
In the Patuxent river.....	600,000
Total.....	<hr/> 1,100,000

SHAD AT CHOPTANK STATION.

Date.	FISH TAKEN.		Eggs Fer-tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
April 21...	2	1	25,000		
23....	1	1	25,000		
24....	1	1	25,000		
25....				45,000	Tuckahoe creek.
27....	3	2	50,000	25,000	Tuckahoe creek.
28....	2	2	50,000	100,000	Tuckahoe creek.
29....	3	4	100,000		
30....	1	1	25,000		
May 2....	2	3	75,000		
4....	6	15	375,000		
5....	8	8	200,000	90,000	Tuckahoe creek.
6....	3	4	100,000		
7....	2	2	50,000		
11....	1	2	50,000	700,000	Chester river.
12....	2	3	75,000	40,000	Tuckahoe creek.
13....	3	4	100,000		
15 ..	2	2	50,000		
16 ...	1	2	50,000		
18....	4	5	125,000	100,000	Tuckahoe creek.
19....	3	4	100,000	50,000	Tuckahoe creek.
20....	8	7	175,000		
21....	1	2	50,000		
25....				480,000	Choptank river.
	59	75	1,875,000	1,670,000	

HERRING AT NANTICOKE STATION.

Date.	FISH TAKEN.		Eggs Fer-tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
April 15....	4	3	75,000		
16....	4	4	100,000		
20....	22	22	500,000	70,000	Nanticoke river.
21....	50	49	1,175,000	75,000	Nanticoke river.
22....	21	20	500,000		
23....	3	6	150,000	400,000	Nanticoke river.
24....	1	1	25,000	1,100,000	Nanticoke river.
25....				475,000	Nanticoke river.
29....				125,000	Nanticoke river.
28....				25,000	Nanticoke river.
May 5....	3	3	75,000		
8....				70,000	Nanticoke river
21....	45	41	1,025,000		
22....	43	43	1,075,000		
23....	60	52	1,300,000		
24....				1,000,000	Nanticoke river.
25....	86	81	2,025,000	1,325,000	Nanticoke river.
26. .	38	38	950,000	1,200,000	Marshy Hope river.
27....	37	36	900,000		
28....				1,225,000	Nanticoke river.
29....				900,000	Marshy Hope river.
30....				850,000	Nanticoke river.
	416	331	9,875,000	9,240,000	

WHITE PERCH AT NANTICOKE STATION.

Date.	FISH TAKEN.		Eggs Fer- tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
April 9.....	20	18	450,000		
10.....	5	5	125,000		
13.....	6	6	150,000		
15.....	20	19	475,000		
16.....	3	3	75,000		
17.....				500,000	Nanticoke river.
18.....	11	9	225,000	100,000	Nanticoke river.
19.....				425,000	Nanticoke river.
20.....	50	46	1,150,000	70,000	Nanticoke river.
21.....				200,000	Nanticoke river.
22.....	85	75	1,875,000		
23.....				1,000,000	Nanticoke river.
24.....	12	12	300,000		
25.....				1,700,000	Nanticoke river.
27.....	9	8	200,000		
28.....				250,000	Nanticoke river.
30.....	12	12	300,000	170,000	Nanticoke river.
May 1.....	3	3	75,000		
4.....	85	80	2,000,000	320,000	Nanticoke river.
6.....	33	32	800,000		
8.....				1,900,000	Nanticoke river.
10.....				725,000	Chicamacomico river.
11.....	25	20	300,000		
15.....				425,000	Nanticoke river.
19.....	9	8	200,000		
22.....				250,000	Marshy Hope river.
	388	35	8,900,000	8,035,000	

SHAD AT WICOMICO STATION.

Date.	FISH TAKEN.		Eggs Fer- tilized.	Fry Hatched.	Fry Deposited.
	Male.	Female.			
April 6.....	1	1	25,000		
7.....	1	1	25,000		
21.....	11	7	175,000		
24.....	2	1	25,000		
29.....	8	6	150,000	241,000	Wicomico river.
May 1.....	3	1	25,000		
4.....	24	19	475,000		
5.....	9	9	225,000	225,000	Pocomoke river.
7.....	14	8	200,000		
8.....	3	2	60,000		
12.....	5	5	125,000		
13.....	5	3	75,000	300,000	Pocomoke river.
18.....	6	4	100,000	50,000	Wicomico river.
19.....	7	6	150,000	200,000	Chester river.
20.....	7	5	125,000	200,000	Pocomoke river.
21.....	3	3	75,000	50,000	Wicomico river.
22.....	7	4	100,000		
26.....	5	5	125,000	250,000	Wicomico river.
28.....				125,000	Wicomico river.
June 2.....	1	1	25,000		
4.....	5	4	75,000		
5.....				75,000	Wicomico river.
	127	95	2,360,000	1,691,000	

SHAD AT NANTICOKE STATION.

Date.	FISH TAKEN.		Eggs Fer- tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
April 23....	4	3	60,000		
27....	2	2	40,000	20,000	Nanticoke river.
May 1....	2	2	40,000		
4....				35,000	Nanticoke river.
5....	4	4	80,000	35,000	Nanticoke river.
9....				75,000	Nanticoke river.
21....	6	5	100,000		
22....	3	2	50,000		
25....				95,000	Nanticoke river.
26....				45,000	Nanticoke river.
	21	16	370,000	305,000	

HERRING AT WICOMICO STATION.

Date,	FISH TAKEN.		Eggs Fer- tilized,	Fry Hatched.	Where Deposited.
	Male.	Female.			
Mch. 31....	4	2	14,000		
April 3....	5	3	55,000		
4....	4	2	30,000		
6....	5	2	45,000		
7....	15	7	170,000		
8....	18	14	220,000	200,000	Wicomico river.
9....	11	5	110,000		
11....	12	5	125,000		
12....				300,000	Wicomico river.
16....	3	1	15,000	45,000	Wicomico river.
17....	16	7	148,000		
18....	9	8	200,000		
20....	58	39	1,000,000	200,000	Wicomico river.
21....	60	27	675,000		
22....	11	4	100,000		
23....				1,391,682	Wicomico river.
25....				75,000	Wicomico river.
27....	10	4	100,000		
28....	5	3	75,000		
30....				116,000	Wicomico river.
May 1....	1	1	25,000		
4....	8	5	125,000		
June 1....	20	16	400,000		
2....	21	15	375,000	336,000	St. Martin's river.
4....				318,000	Wicomico river.
	299	172	4,005,000	2,981,682	

WHITEFISH AT WICOMICO STATION.

Date.	Eggs Received.	Fry Hatched.	Where Deposited.
Jan'y 7....	1,000,000		
26....		330,000	Elk and Big Elk rivers.
Feb'y 2....		200,000	Sassafras and Bohemia rivers.
3....		100,000	Choptank river.
6....		100,000	Nanticoke river.
9....		100,000	Wicomico river.
11....		100,000	Pocomoke river.
	1,000,000	900,000	

WHITE PERCH AT CHOPTANK STATION.

Date.	FISH TAKEN.		Eggs Fer- tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
April 9....	5	2	40,000		
15.....	4	3	60,000		
16.....	5	3	60,000	30,000	Tuckahoe creek.
17.....	12	11	230,000		
18.....	5	3	60,000		
20.....	86	80	1,600,000		
21.....	34	30	600,000	45,000	Tuckahoe creek.
22.....	19	18	330,000	45,000	Tuckahoe creek.
23.....	9	6	120,000	230,000	Tuckahoe creek.
27.....				1,400,000	Tuckahoe creek.
28.....				520,000	Tuckahoe creek.
29.....				310,000	Tuckahoe creek.
30.....				100,000	
	179	156	3,120,000	2,710,000	

YELLOW PERCH AT WICOMICO STATION.

Date.	FISH TAKEN.		Eggs Fer- tilized.	Fry Hatched.	Where Deposited.
	Male.	Female.			
Mch. 30.....	28	15	600,000		
31.....	60	30	1,200,000		
Apr. 1.....	53	30	1,200,000		
2.....	35	30	1,200,000		
15.....				300,000	Humphrey's lake.
15.....				300,000	Wicomico river.
17.....				1,500,000	Nanticoke river.
20.....				1,800,000	Wicomico river.
	181	105	4,200,000	3,900,000	

ROCK—PERCH.

Apr. 24.....	6	2	45,000		
25.....	8	3	65,000		
28.....				77,000	Wicomico river.
	14	5	110,000	77,000	

SHAD—HERRING.

Apr. 16.....	3	2	40,000		
19.....				30,000	Wicomico river.

SALMON—TROUT.

Date.	Eggs Received.	Fry Hatched.	Where Deposited.
Dec. 24, 1884	20,000		
Ap'l 8, 1885		14,000	

DISTRIBUTION OF GERMAN CARP.

Date.	Name.	Town.	County.	No.
1885.				
November.	Jno. W. Knotts....	Hillsborough....	Caroline.....	100
Do.....	D. H. Knotts.....	Hillsborough....	Caroline.....	100
Do.....	H. I. Bell.....	Ridgeley.....	Caroline.....	100
Do.....	Geo. C. Moore.....	Talbot.....	100
Do.....	William Sisk.....	Preston.....	Caroline.....	100
Do.....	S. S. Mills.....	Corbin.....	Worcester.....	100
Do.....	Samuel T. Earle.....	Centreville.....	Queen Anne's.....	100
Do.....	Thos. Humphreys.....	Salisbury.....	Wicomico.....	100
Do.....	Jno. A. Insley.....	Tyaskin.....	Wicomico.....	100
Do.....	Geo. A. Insley.....	Tyaskin.....	Wicomico.....	100
Do.....	E. S. D. Insley.....	Tyaskin.....	Wicomico.....	100
Do.....	Mrs. D. W. Young.....	Federalsburg....	Dorchester.....	100
Do.....	Geo. W. Cordray.....	Tyaskin.....	Wicomico.....	100
Do.....	Henry L. Fisher.....	Hillsborough....	Caroline.....	100
Do.....	C. E. Flemming.....	Hillsborough....	Caroline.....	100
Do.....	W. F. Pennington.....	Hillsborough....	Caroline.....	100
Do.....	David S. Moore.....	Greensboro'....	Caroline.....	100
Do.....	James H. Raymond.....	Still Pond.....	Kent.....	100
Do.....	Joseph Madalieu.....	Millington.....	Queen Anne's.....	100
Do.....	Wm. S. Bowers.....	Still Pond.....	Kent.....	100
Do.....	James Young.....	Rock Hall.....	Kent.....	100
Do.....	Henry K. Smith.....	Millington.....	Queen Anne's.....	100
December.	Geo. W. Parsons.....	Salisbury.....	Wicomico.....	100
Do.....	J. M. Sudler.....	Sudlersville....	Queen Anne's.....	100
Do.....	J. Boone Dukes.....	Denton.....	Caroline.....	100
Do.....	Edw'd Salisbury.....	Denton.....	Caroline.....	100
Do.....	Jno. H. George.....	Griffin.....	Caroline.....	100
Do.....	Wm. H. Thawley.....	Hillsborough....	Caroline.....	100
Do.....	Dr. J. L. Adkins.....	Easton.....	Talbot.....	100
Do.....	Danl. Smith.....	Vienna.....	Dorchester.....	100
Do.....	James K. Covington.....	Tyaskin.....	Wicomico.....	100
Do.....	Wm. Steele.....	Easton.....	Talbot.....	100
Do.....	Joshua Carey.....	Berlin.....	Worcester.....	100
Do.....	James M. Benton.....	Sudlersville....	Queen Anne's.....	100
Do.....	Decatur H. Roberts.....	Easton.....	Talbot.....	100
Do.....	Solomon Pippin.....	Easton.....	Talbot.....	100
Do.....	Dr. E. R. Trippe.....	Easton.....	Talbot.....	100
Do.....	Henry M. Mason.....	Easton.....	Talbot.....	100
Do.....	Mrs. Buchanan.....	Easton.....	Talbot.....	100
Do.....	W. T. H. Lee.....	Easton.....	Talbot.....	100
Do.....	Mr. Lame.....	Easton.....	Talbot.....	100
Do.....	John Stelle.....	Easton.....	Talbot.....	100
Do.....	Gen. Joseph B. Seth.....	Easton.....	Talbot.....	100

